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REV03

INVERTEC 175TP

OPERATOR'S MANUAL

ENGLISH

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12/05

THANKS! For having chosen the QUALITY of the Lincoln Electric products.

- Please Examine Package and Equipment for Damage. Claims for material damaged in shipment must be notified immediately to the dealer.
- For future reference record in the table below your equipment identification information. Model Name, Code & Serial Number can be found on the machine rating plate.

Model Name:	
.....	
Code & Serial number:	
.....	.....
Date & Where Purchased:	
.....	.....

INDEX

Technical Specifications

PRIMARY SIDE		
	MMA	TIG
Single phase supply	230 V	
Frequency	50/60 Hz	
Effective consumption	15 A	11 A
Maximum consumption	21 A	14 A
SECONDARY SIDE		
Open circuit voltage	50 V	
Peak voltage		10kV
Welding current	5 A ÷ 175 A	
Duty cycle 25%	175 A	
Duty cycle 60%	140 A	
Duty cycle 100%	120 A	130 A
MISCELLEANOUS		
Protection class	IP 23	
Insulation class	H	
Weight	10,2 Kg	
Dimensions	210 x 330 x 480 mm	
European Standards	EN 60974.1 / EN 60974.3 / EN 60974.10	

ECO design information

The equipment has been designed in order to be compliant with the Directive 2009/125/EC and the Regulation 2019/1784/EU.

Efficiency and idle power consumption:

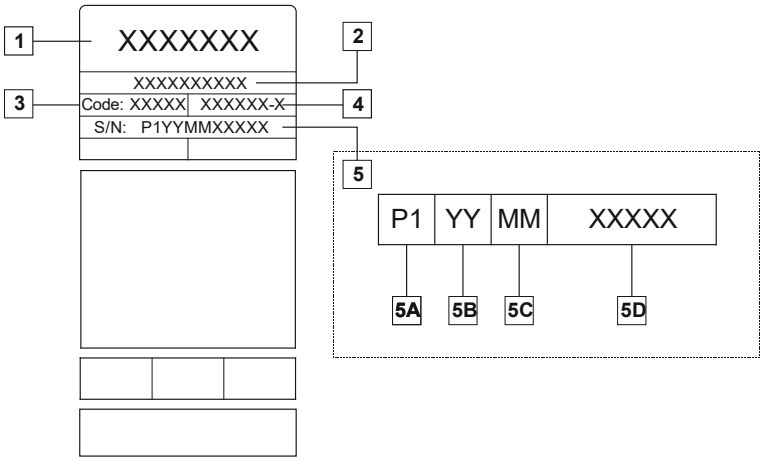
Index	Name	Efficiency when max power consumption / Idle power consumption	Equivalent model
K14169-1	INVERTEC 175TP	84,7% / 22 W	No equivalent model

Idle state occurs under the condition specified in below table

IDLE STATE	
Condition	**Presence**
MIG mode	
TIG mode	X
STICK mode	
After 30 minutes of non-working	
Fan off	

The value of efficiency and consumption in idle state have been measured by method and conditions defined in the product standard EN 60974-1:20XX

Manufacturer's name, product name, code number, product number, serial number and date of production can be read from rating plate.



Where:

- **1-** Manufacturer name and address
- **2-** Product name
- **3-** Code number
- **4-** Product number
- **5-** Serial number
  - **5A-** country of production
  - **5B-** year of production
  - **5C-** month of production
  - **5D-** progressive number different for each machine

Typical gas usage for **MIG/MAG** equipment:

Material type	Wire diameter [mm]	DC electrode positive		Wire Feeding [m/min]	Shielding Gas	Gas flow [l/min]
		Current [A]	Voltage [V]			
Carbon, low alloy steel	0,9 ÷ 1,1	95 ÷ 200	18 ÷ 22	3,5 – 6,5	Ar 75%, CO_2 25%	12
Aluminium	0,8 ÷ 1,6	90 ÷ 240	18 ÷ 26	5,5 – 9,5	Argon	14 ÷ 19
Austenic stainless steel	0,8 ÷ 1,6	85 ÷ 300	21 ÷ 28	3 - 7	Ar 98%, O_2 2% / He 90%, Ar 7,5% CO_2 2,5%	14 ÷ 16
Copper alloy	0,9 ÷ 1,6	175 ÷ 385	23 ÷ 26	6 - 11	Argon	12 ÷ 16
Magnesium	1,6 ÷ 2,4	70 ÷ 335	16 ÷ 26	4 - 15	Argon	24 ÷ 28

Tig Process:

In TIG welding process, gas usage depends on cross-sectional area of the nozzle. For comonnly used torches:

Helium: 14-24 l/min
Argon: 7-16 l/min

Notice: Excessive flow rates causes turbulence in the gas stream which may aspirate atmospheric contamination into the welding pool.

Notice: A cross wind or draft moving can disrupt the shielding gas coverage, in the interest of saving of protective gas use screen to block air flow.

End of life

At end of life of product, it has to be disposal for recycling in accordance with Directive 2012/19/EU (WEEE), information about the dismantling of product and Critical Raw Material (CRM) present in the product, can be found at https://www.lincolnelectric.com/en-gb/support/Pages/operator-manuals-eu.aspx

Electromagnetic Compatibility (EMC)

01/11

This machine has been designed in accordance with all relevant directives and standards. However, it may still generate electromagnetic disturbances that can affect other systems like telecommunications (telephone, radio, and television) or other safety systems. These disturbances can cause safety problems in the affected systems. Read and understand this section to eliminate or reduce the amount of electromagnetic disturbance generated by this machine.

WARNING

This machine has been designed to operate in an industrial area. The operator must install and operate this equipment as described in this manual. If any electromagnetic disturbances are detected the operator must put in place corrective actions to eliminate these disturbances with, if necessary, assistance from Lincoln Electric. This equipment is compliant with EN 61000-3-12 and EN 61000-3-11.

Before installing the machine, the operator must check the work area for any devices that may malfunction because of electromagnetic disturbances. Consider the following.

- Input and output cables, control cables, and telephone cables that are in or adjacent to the work area and the machine.
- Radio and/or television transmitters and receivers. Computers or computer controlled equipment.
- Safety and control equipment for industrial processes. Equipment for calibration and measurement.
- Personal medical devices like pacemakers and hearing aids.
- Check the electromagnetic immunity for equipment operating in or near the work area. The operator must be sure that all equipment in the area is compatible. This may require additional protection measures.
- The dimensions of the work area to consider will depend on the construction of the area and other activities that are taking place.

Consider the following guidelines to reduce electromagnetic emissions from the machine.

- Connect the machine to the input supply according to this manual. If disturbances occur if may be necessary to take additional precautions such as filtering the input supply.
- The output cables should be kept as short as possible and should be positioned together. If possible connect the work piece to ground in order to reduce the electromagnetic emissions. The operator must check that connecting the work piece to ground does not cause problems or unsafe operating conditions for personnel and equipment.
- Shielding of cables in the work area can reduce electromagnetic emissions. This may be necessary for special applications.

WARNING

The Class A equipment is not intended for use in residential locations where the electrical power is provided by the public low-voltage supply system. There can be potential difficulties in ensuring electromagnetic compatibility in those locations, due to conducted as well as radio-frequency disturbances.

Safety

01/11

WARNING

This equipment must be used by qualified personnel. Be sure that all installation, operation, maintenance and repair procedures are performed only by qualified person. Read and understand this manual before operating this equipment. Failure to follow the instructions in this manual could cause serious personal injury, loss of life, or damage to this equipment. Read and understand the following explanations of the warning symbols. Lincoln Electric is not responsible for damages caused by improper installation, improper care or abnormal operation.

	WARNING: This symbol indicates that instructions must be followed to avoid serious personal injury, loss of life, or damage to this equipment. Protect yourself and others from possible serious injury or death.
	READ AND UNDERSTAND INSTRUCTIONS: Read and understand this manual before operating this equipment. Arc welding can be hazardous. Failure to follow the instructions in this manual could cause serious personal injury, loss of life, or damage to this equipment.
	ELECTRIC SHOCK CAN KILL: Welding equipment generates high voltages. Do not touch the electrode, work clamp, or connected work pieces when this equipment is on. Insulate yourself from the electrode, work clamp, and connected work pieces.
	ELECTRICALLY POWERED EQUIPMENT: Turn off input power using the disconnect switch at the fuse box before working on this equipment. Ground this equipment in accordance with local electrical regulations.
	ELECTRICALLY POWERED EQUIPMENT: Regularly inspect the input, electrode, and work clamp cables. If any insulation damage exists replace the cable immediately. Do not place the electrode holder directly on the welding table or any other surface in contact with the work clamp to avoid the risk of accidental arc ignition.
	ELECTRIC AND MAGNETIC FIELDS MAY BE DANGEROUS: Electric current flowing through any conductor creates electric and magnetic fields (EMF). EMF fields may interfere with some pacemakers, and welders having a pacemaker shall consult their physician before operating this equipment.
CE	CE COMPLIANCE: This equipment complies with the European Community Directives.
	ARTIFICIAL OPTICAL RADIATION: According with the requirements in 2006/25/EC Directive and EN 12198 Standard, the equipment is a category 2. It makes mandatory the adoption of Personal Protective Equipments (PPE) having filter with a protection degree up to a maximum of 15, as required by EN169 Standard.
	FUMES AND GASES CAN BE DANGEROUS: Welding may produce fumes and gases hazardous to health. Avoid breathing these fumes and gases. To avoid these dangers the operator must use enough ventilation or exhaust to keep fumes and gases away from the breathing zone.
	ARC RAYS CAN BURN: Use a shield with the proper filter and cover plates to protect your eyes from sparks and the rays of the arc when welding or observing. Use suitable clothing made from durable flame-resistant material to protect you skin and that of your helpers. Protect other nearby personnel with suitable, non-flammable screening and warn them not to watch the arc nor expose themselves to the arc.

	WELDING SPARKS CAN CAUSE FIRE OR EXPLOSION: Remove fire hazards from the welding area and have a fire extinguisher readily available. Welding sparks and hot materials from the welding process can easily go through small cracks and openings to adjacent areas. Do not weld on any tanks, drums, containers, or material until the proper steps have been taken to insure that no flammable or toxic vapors will be present. Never operate this equipment when flammable gases, vapors or liquid combustibles are present.
	WELDED MATERIALS CAN BURN: Welding generates a large amount of heat. Hot surfaces and materials in work area can cause serious burns. Use gloves and pliers when touching or moving materials in the work area.
	CYLINDER MAY EXPLODE IF DAMAGED: Use only compressed gas cylinders containing the correct shielding gas for the process used and properly operating regulators designed for the gas and pressure used. Always keep cylinders in an upright position securely chained to a fixed support. Do not move or transport gas cylinders with the protection cap removed. Do not allow the electrode, electrode holder, work clamp or any other electrically live part to touch a gas cylinder. Gas cylinders must be located away from areas where they may be subjected to physical damage or the welding process including sparks and heat sources.
HF	CAUTION: The high frequency used for contact-free ignition with TIG (GTAW) welding, can interfere with the operation of insufficiently shielded computer equipment, EDP centers and industrial robots, even causing complete system breakdown. TIG (GTAW) welding may interfere with electronic telephone networks and with radio and TV reception.
	WARNING: Stability of the equipment is guaranteed only for an incline of maximum 10°
	WARNING: Welding/cutting equipment must only be used for the purpose for which it is intended. It must never be used for any other purpose, such as battery charging, thawing out frozen water pipes, heating premises by the addition of heating elements, etc.
S	SAFETY MARK: This equipment is suitable for supplying power for welding operations carried out in an environment with increased hazard of electric shock.

The manufacturer reserves the right to make changes and/or improvements in design without upgrade at the same time the operator's manual.

Installation and Operator Instructions

Technical description

Description
The system consists of a modern direct current generator for the welding of metals, developed via application of the inverter. This special technology allows for the construction of compact light weight generators with high performance. It's adjust ability, efficiency and energy consumption make it an excellent work tool suitable for coated electrode and GTAW (TIG) welding).

Technical data
The machine can be connected to a motor generator of power meeting the data plate specifications and having the following characteristics:
- Output voltage between 185 and 275 Vac.
- Frequency between 50 and 60 Hz.

IMPORTANT: MAKE SURE THE POWER SOURCE MEETS THE ABOVE REQUISITES. EXCEEDING THE SPECIFIED VOLTAGE CAN DAMAGE THE WELDING MACHINE AND INVALIDATE THE WARRANTY.

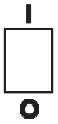
Duty cycle and overheating
Duty cycle is the percentage of 10 minutes at 40°C ambient temperature that the unit can weld at its rated output without overheating. If the unit overheats, the output stops and the over temperature light comes On. To correct the situation, wait fifteen minutes for unit to cool. Reduce amperage, voltage or duty cycle before starting to weld again (See page III).

Volt - ampere curves
Volt-ampere curves show the maximum voltage and amperage output capabilities of the welding power source. Curves of other settings fall under curves shown (See page III).

Installation
Important: before connecting, preparing or using equipment, read safety precautions.

Connecting the power source to the mains electricity supply
SERIOUS DAMAGE TO THE EQUIPMENT MAY RESULT IF THE POWER SOURCE IS SWITCHED OFF DURING WELDING OPERATIONS.
Check that the power socket is equipped with the fuse indicated in the features label on the power source. All power source models are designed to compensate power supply variations. For variations of + 15% a welding current variation of +- 0,2% is created.

BEFORE INSERTING THE MAINS PLUG, IN ORDER TO AVOID THE FAIL OF POWER SOURCE, CHECK IF THE MAINS CORRESPONDS TO THE WISHED MAIN SUPPLY.



On - off switch: This switch has two positions: ON = I and OFF = O.

THIS CLASS A EQUIPMENT IS NOT INTENDED FOR USE IN RESIDENTIAL LOCATIONS WHERE THE ELECTRICAL POWER IS PROVIDED BY THE PUBLIC LOW-VOLTAGE SUPPLY SYSTEM. THERE MAY BE POTENTIAL DIFFICULTIES IN ENSURING ELECTROMAGNETIC COMPATIBILITY IN THOSE LOCATIONS, DUE TO CONDUCTED AS WELL AS RADIATED DISTURBANCES.

Connection and preparation of equipment for stick welding
TURN OFF WELDER BEFORE MAKING CONNECTIONS.
Connect all welding accessories securely to prevent power loss. Carefully follow safety precautions described.
- Fit the selected electrode to the electrode clamp.
- Connect the ground cable quick connection to the negative (-) receptacle and locate the clamp near the welding zone.
- Connect the electrode cable quick connection to the positive (+) receptacle.
- Use the above connection for straight polarity welding; for reverse polarity turn the connection.
- On the unit preset for coated electrode welding  (Ref.1 - Picture 1 Page 6.).
- Adjust welding current with ampere selector (Ref. 3 - Picture 1 Page 6.).
- Turn on the power source.

Connection and preparation of equipment for gas tungsten arc welding TIG
TURN OFF WELDER BEFORE MAKING CONNECTIONS.
Connect all welding accessories securely to prevent power loss. Carefully follow safety precautions described.
- Position the welder in TIG LIFT and TIG HF mode.
- Fit the required electrode and nozzle to the electrode holder (Check the protrusion and state of the electrode tip).
- Connect the ground cable quick connection to the positive (+) receptacle and the clamp near the welding zone.
- Connect the torch power cable connector to the negative receptacle (-).
- Connect the gas hose to the regulator located on the gas cylinder.
- Regulate the welding mode and the desired parameters (Section 5.0).
- Open the gas valve on the torch.
- Connection of relay command.
- When relay command is required connect the relay to the socket on the front panel. In this position regulation can be fractioned through the power gauge.
- Turn on the power source.

Functions

Front panel

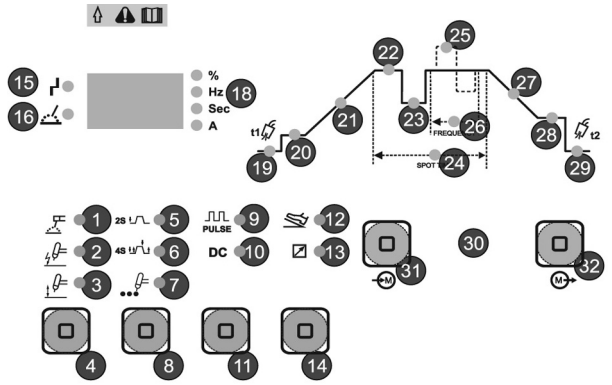


Figure 1

1	Covered Electrode Welding Indicator (MMA)	18	Digital Instrument mode
2	TIG DC Welding Indicator with High Freq. Start	19	Pre Gas Indicator
3	TIG DC Welding Indicator with Lift Start	20	Initial Current Indicator (Four Times mode)
4-8 11 14	Vertical Function Key	21	Ascent Slope Indicator
5	Welding Indicator (Two Times)	22	Nominal Current Welding Indicator
6	Welding Indicator (Four Times)	23	Reduced Current Indic. (Four Times mode)
7	Spot Welding Indicator	24	Spot Time Indicator
9	TIG CD Pressed Indicator	25	Wave-Shaped Balance Indi- cator
10	TIG CD Indicator	26	Pressed Frequency Indicator
12	Remote Control Indicator	27	Descent Slope Indicator
13	Remote Control Indicator	28	Final Current Indicator (Four Times mode)
15	Alarm Indicator	29	Post Gas Indicator
16	Current Supply Indicator	30	Regulation Knob
17	Digital Instrument	31 32	Left scrolling kex/Memorized program recall Right scrolling key/Storage program

Welding set up

Function keys

If you press for at least a second the function keys On the panel as represented by the symbol

It is possible to select the desired welding functions. With each function key pressed you are selecting a welding function.
IMPORTANT: VERTICAL FUNCTION KEYS DO NOT WORK DURING THE WELDING STAGE.

Covered Electrode Welding MMA

By pressing the function key 4 and taking the luminous indicator on symbol 1 - Picture 1 Page 6.) you can select the mode of electrode welding.

Welding TIG DC HF

By pressing the function key 4 - Picture 1 Page 6.) you can select the mode of TIG welding with high-voltage start until the luminous indicator reaches the position on symbol 2 - Picture 1 Page 6.), If you press the torch button you will get a high-voltage discharge that allows the arc fusing.

TIG DC Welding with Lift Start

By pressing the function key 4 - Picture 1 Page 6.) you can select the mode of TIG welding with lift start until the luminous indicator reaches the position on symbol 3 - Picture 1 Page 6.).
In this mode the arc fusing occurs with the following sequence:

- If the electrode points to the welding piece it provokes the short-circuit between the piece and the electrode.
- Pressing the torch key the pre gas is set. The end of the pre gas is indicated by a long BEEP. If that operation is carried out starting from the post gas you get the long BEEP immediately as soon as you press the torch key.
- During the BEEP it is possible to lift the electrode from the piece provoking the arc fuse.

Two Times Welding

Active only in TIG mode.
By pressing the function key 8 - Picture 1 Page 6.) you can position the luminous indicator on symbol 5 - Picture 1 Page 6.). In this mode you press the torch button to prime the welding current and it should be pressed whilst welding.

Four Times Welding

Active only in TIG mode.
By pressing the function key 8 - Picture 1 Page 6.) you can position the luminous indicator on symbol 6 - Picture 1 Page 6.). In this mode the torch button works in four times for an automatic weld. The gas flux is activated by first pressing the torch button. By releasing the button the welding arc is primed. The second pressing on the torch button interrupts the welding. By releasing the gas flux is deactivated.

Spot Welding
Active only in TIG mode
can position the luminous indicator on symbol 7 - Picture 1 Page 6.). In this mode you obtain a spot welding timed with a set up timer as described on reference 24 - Spot time.

TIG pressed
Once the TIG mode is selected (Lift or HF), press the function key 11 - Picture 1 Page 6.) until the luminous indicator reaches the position on symbol 9 - Picture 1 Page 6). In this mode the current pulsates between a maximum and a minimum value and can be set up as described on reference 22: Nominal Current Welding and e 23: Reduced Current respectively.

TIG DC
Once the TIG (Lift or HF) mode is selected press the function key 11 - Picture 1 Page 6.) until the luminous indicator reaches the position on symbol 10 - Picture 1 Page 6.).

Remote
In order to connect the remote control press the function key 14 - Picture 1 Page 6.) until the luminous indicator reaches the position on symbol 12 - Picture 1 Page 6.).

Local
In order to connect the remote control press the function key 14 - Picture 1 Page 6.) until the luminous indicator reaches the position on symbol 13 - Picture 1 Page 6.).

Alarm Indicator
When one of the alarms goes off the indicator 15 - Picture 1 Page 6.) and the display 17 - Picture 1 Page 6.) The alarm, the relative indications and the instructions to follow to restore the generator are shown immediately:

DISPLAY	MEANING
— — —	Insufficient voltage entry, line switch open or lack of line, no V regulated.
LtF	Interface connector disconnected, absence of the 24V auxiliary voltage, other interface problems.
ThA	Power converter overheated.
	Restoration occurs when the alarm stops.
SCA	Short-circuit caused by: Generator's terminal output in short-circuit. Output stage failure.
	Eliminate the short-circuit. Call after-sales service.
PiF	The inverter stage does not work properly.

NOTE

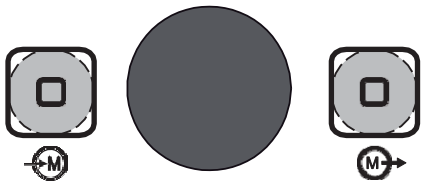
whenever all the panel luminous indicators remain on or off simultaneously for more than 40 seconds it will be necessary to contact the manufacturer.

Current supply
The indicator 16 - Picture 1 Page 6.) lights up every time the generator is supplying a current.

Led
Symbols that display the following; Duty Cycle, Frequency, Time, Amps) 18 - Picture 1 Page 6.).
- %
- Hz
- Sec
- A

Welding process profile
In this section of the panel you can set up all the parameters in order to improve the process previously selected.

Function keys
Press the function keys 31 o 32 - Picture 1 Page 6.) for at least a second with the symbols:

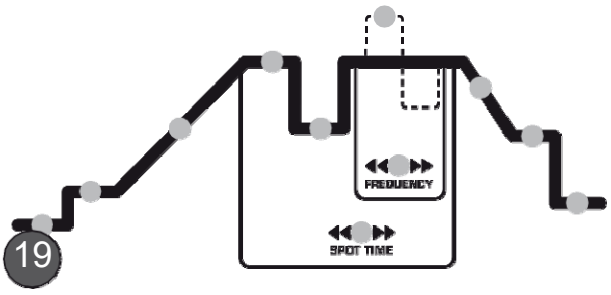


In order to select the welding parameters that you wish to modify. By pressing a function key you select the different welding modes.
Please note that during every single parameter the corresponding luminous indicator lights up. The display 17 - Picture 1 Page 6.) and the led 18 - Picture 1 Page 6.) indicate the parameter's value and unity measure respectively.

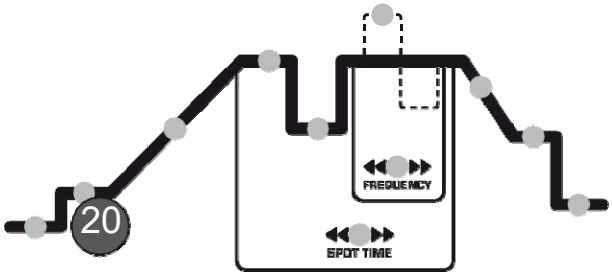
NOTE

This section of the panel is changeable during welding.

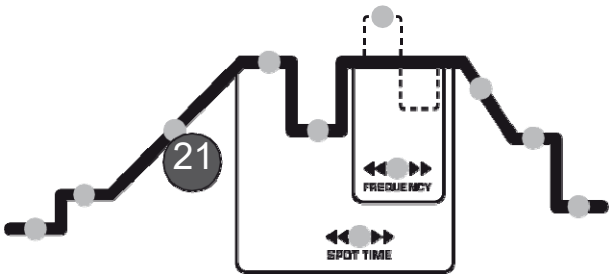
Pre gas
By pressing function keys 31 e 32 the luminous indicator is position at 19 - Picture 1 Page 6.); then by activating the knob 30, the time length for the gas flux is set up in seconds. The value range is between 0,2 and 5 seconds.



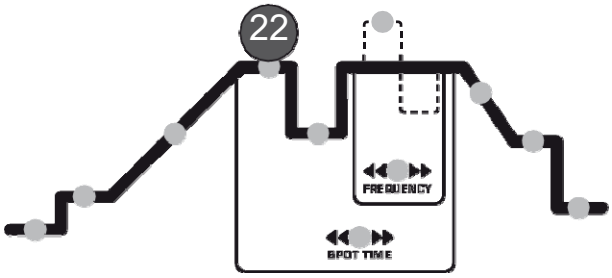
Initial Current
By pressing function keys 31 e 32 the luminous indicator is position at 20 - Picture 1 Page 6.); then by activating the knob 30, the value for the initial current on the mode TIG Four Times is set up. The value range is between I Min and the nominal current welding.



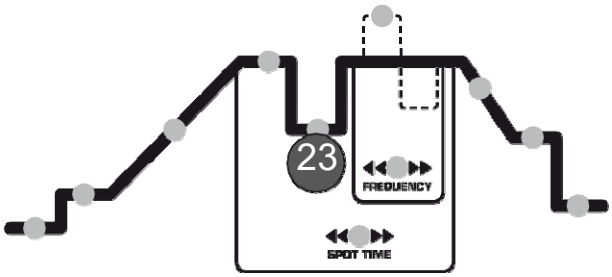
Ascent Slope
By pressing function keys 31 e 32 the luminous indicator is position at 21 - Picture 1 Page 6.); then by activating the knob 30, the time to reach the nominal current welding in TIG modality is set up. The value range is between 0 and 10 seconds.



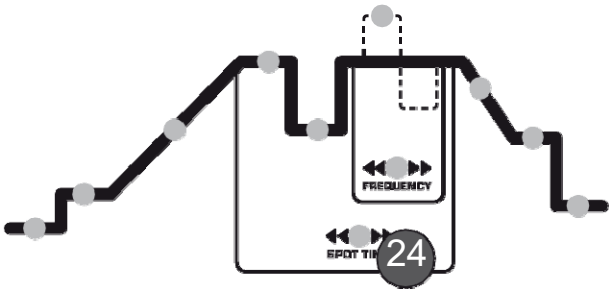
Nominal Current Welding
By pressing function keys 31 e 32 the luminous indicator is position at 22 - Picture 1 Page 6.); then by activating the knob 30, the value for the nominal current welding for alvl the available modalities is set up. The value range is between 5A and 220A in electrode mode; 5A and 220A.



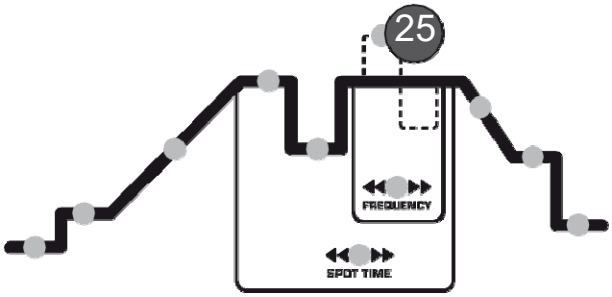
Reduced Current/ Basic Current.
By pressing function keys 31 e 32 the luminous indicator is position at 23 - Picture 1 Page 6.); then by activating the knob 30, the value for the reduced current in the Four Times mode is set up. If the TIG mode is pressed (either Two or Four Times) the pulsation of the basic current is set up. The value range is between the nominal current welding and the 10% of that same value.



Spot Time
By pressing function keys 31 e 32 the luminous indicator is position at 24 - Picture 1 Page 6.); then by activating the knob 30, the time length for the spot impulse is set up in seconds. TIG The value range is between 0,1 and 10 seconds.



Wave-shaped Balance
By pressing function keys 31 e 32 the luminous indicator is position at 25 - Picture 1 Page 6.); then by activating the knob 30, the balance of the different wave shapes pressed on TIG is set up.
The wave-shaped balance can be set up in a value ranging from 1 and 99 for frequencies between 0,3 Hz and 15 Hz. The range decreases linearly for higher frequencies (up to 250 Hz) up to range between 30 and 70 (See - Picture 2 Page 6.).



Wave-shaped balance

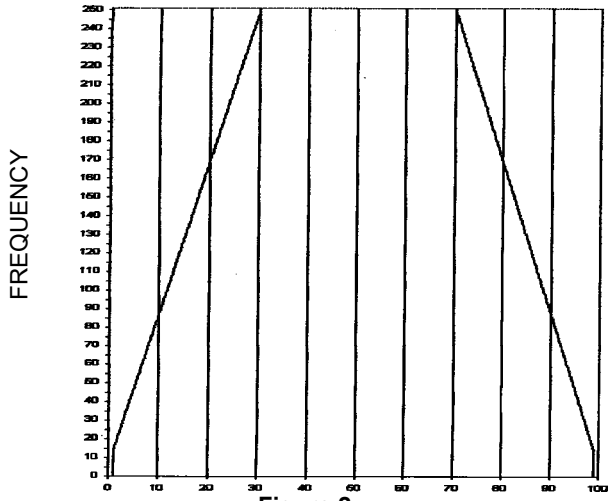


Figure 2

WAVE-SHAPED BALANCE

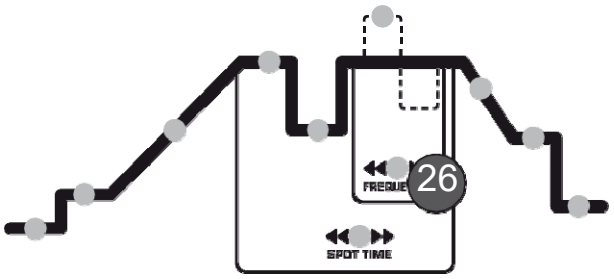
Descent Slope

By pressing function keys 31 e 32 the luminous indicator is position at 27 - Picture 1 Page 6.); then by activating the knob 30, the time is set up in seconds either to reach the final current welding in the Four Times mode, or to cancel the nominal current welding in the Two Times mode.

The frequency can be regulated between the following ranges:

Between 0,3 Hz and 1Hz with a 0,1 Hz step.

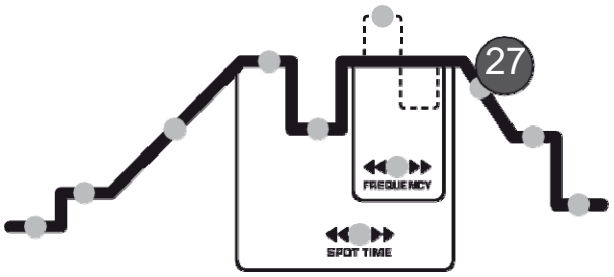
- Between 1 Hz and 250Hz with a 1 Hz step.



Descent Slope

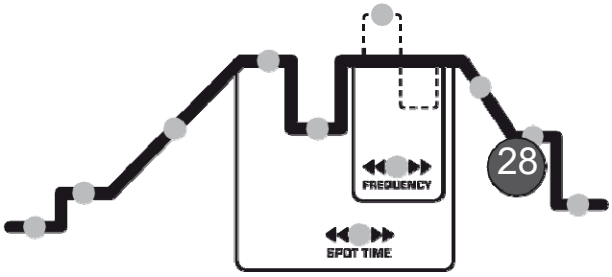
By pressing function keys 31 e 32 the luminous indicator is position at 27 - Picture 1 Page 6.); then by activating the knob 30, the time is set up in seconds either to reach the final current welding in the Four Times mode, or to cancel the nominal current welding in the Two Times mode.

The value range is between 0 and 10 seconds.



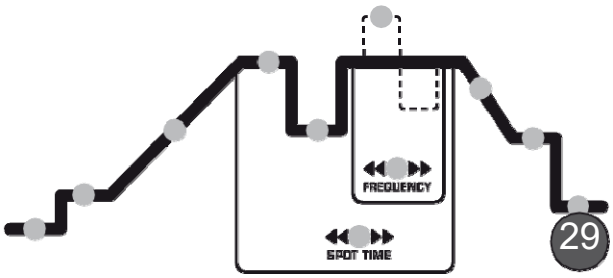
Final Current

By pressing function keys 31 e 32 the luminous indicator is position at 28 - Picture 1 Page 6.); then by activating the knob 30, the value for the final current on the TIG Four Times mode is set up. The value range is between I Min and the nominal current welding.



Post gas

By pressing function keys 31 e 32 32 the luminous indicator is position at 29 - Picture 1 Page 6.) then by activating the knob 30, the time length for the final gas flux is set up in seconds. The value range is between 0,2 and 20 seconds.



Four times functionality for TIG welding

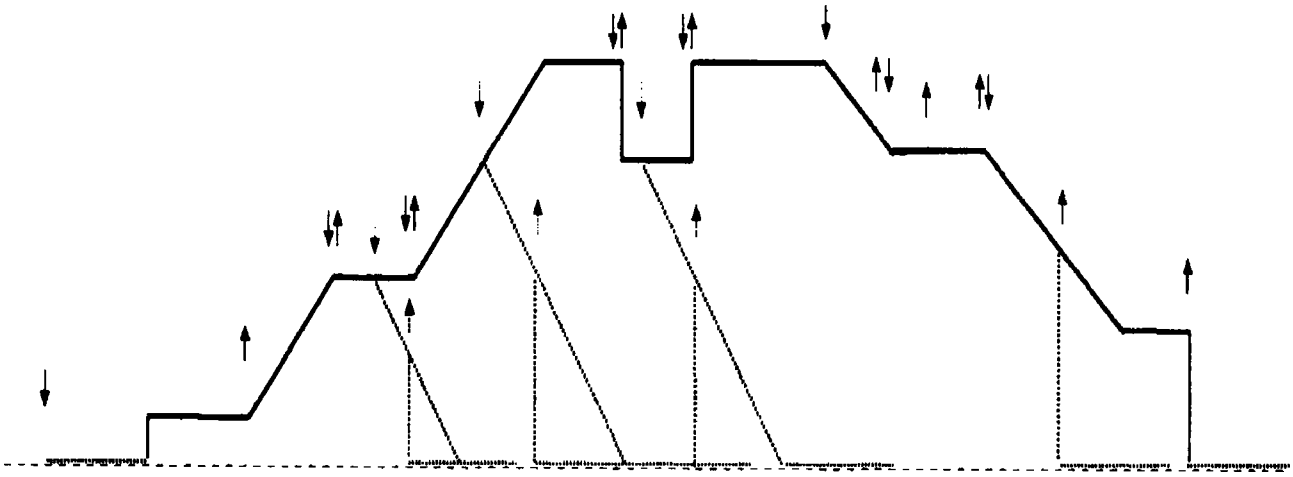
The generator allows a management of the Four Times Intelligent mode. In fact, it is possible to modify the automatic sequence depending on how the torch button is used (See picture).
The current's descent slope is also possible from the reduced current.

Pressure without the torch button release.

Torch button release.

Pressure and immediate release of the torch button.

Release and immediate pressure of the torch button.



AUTOMATIC SEQUENCE

Memorise and recall program

The generator allows you to memorize and subsequently recall up 30 welding programs.

Memorise a program

1. Set the process and the desired welding profile (as specified in § 4.0 and 5.0);
2. Press for more than three seconds the key 32 (entry in the memorise state is accompanied by long "beep" and the first memory location P01on the display);
3. If you want to memorize the program in another memory location, turn the encoder to the right (increasing the number of memory location) to the memory location where you want to memorize the program;
4. Press for more than three seconds the key 32. At this point the program is stored in desired memory location (the memorise is accompanied by long "beep" and the text "MEM" on the display).

The exit from this state is possible in three ways:

1. Memorize of program;
2. Inactivity of key 32 and encoder (10 seconds);
3. Short press of key 32.

NOTE

The memory locations can be overwritten. during the memorise state all keys (with the exception of the key 32 and the encoder) are disabled and therefore you can not change any parameter.

Memorized program recall

1. Press for more than three seconds the key 31 (entry in the recall program state is accompanied by long "beep" and the first memory location P01on the display);
2. Turn the encoder to the right (increasing the number of memory location) to the program memory location that you want to recall;
3. Press for more than three seconds the key 31. At this point desired program is loaded (the recall is accompanied by long "beep").

The exit from this state is possible in three ways:

1. Recalling a program;
2. Inactivity of key 31 and encoder (10 seconds);
3. Short press of key 31.

NOTE

During the recall state all keys (with the exception of the key 31 and the encoder) are disabled and therefore you can not change any parameter.

Welding programs management

The welding and the relative parameters set up can be done manually through various commands.
When first switched on the generator is set up in a predefined state and with welding parameters value that allows to work immediately.
Moreover, the generator is provided with a memory that saves the set up configuration for each welding mode (MMA, TIG HF, TIG Lift) before it is turn off.
Therefore, the worker will be able to see the last set up when the generator is switched on again.

The use of the remote control

The power source allows the use of the remote controls. After connecting the remote control to the female connector on the front of the machine you can choose whether to work in local or remote mode by means of vertical scroll key (Ref. 14 - Picture 1 Page 6.).

NOTE

Pressing vertical scroll key (Ref. 14 - Picture 1 Page 6) when the remote control is not connected has no effect.

In electrode welding mode, after activating the remote function you can adjust welding current continuously from minimum to maximum using the remote control. The display will show the current set with the control.

NOTE

In electrode mode you can select manual remote control only.

In TIG welding mode you can select between two different remote controls:

Manual Remote Control:

this mode is especially useful in combination with remote controls or RC-type torches, i.e. equipped with a knob or slider to regulate current remotely. The welding current will be adjustable continuously from minimum to maximum. To use this peripheral device properly and comfortably selection of "four stroke" mode is recommended.

Pedal-Operated Remote Control:

this mode is especially useful in combination with pedals equipped with a microswitch with a trigger function. This selection involves inhibition of the up and down slopes. Welding current can be adjusted with the pedal between the minimum value and the panel setting.
The microswitch in the control pedal means you can start welding by simply pressing the pedal, i.e. without using the TIG torch button. To use this peripheral device properly and comfortably selection of "four stroke" mode is recommended.

NOTE

In this mode, when the welding process is not active, using the remote control (pedal) will produce no change in the current indicated on the display.

Troubleshooting procedure

Types of malfunctioning / welding faults – causes – remedies.

TYPES OF MALFUNCTIONING WELDING FAULTS	POSSIBLE CAUSES	CONTROLS AND REMEDIES
The generator does not weld: the digital switch is not lit.	The main switch is off. The power lead is interrupted (lack of one or two phases). Other.	Switch on mains. Verify and repair. Ask for the intervention of the Assistance Centre.
During welding suddenly the outgoing current is interrupted, the the orange led goes on.	Overheating has occurred and the automatic protection has come on. (See work cycles).	Keep generator switched on and wait till temperature has dropped again (10-15 minutes) to the point where the orange switch goes off again.
Welding power reduced.	Outgoing wires are not correctly attached. A phase is missing.	Check that wires are intact, that the pliers are sufficient and that they are applied to welding surface clean from rust, paint or oils.
Excessive jets.	Welding arch too long. Welding current too high.	Wrong torch polarity, lower the current values.
Craters.	Fast removal of the electrodes.	
Inclusions.	Inadequate cleaning and bad distribution of coating. Faulty movement of the electrodes.	
Inadequate penetration.	Forward speed too high. Welding current too low.	
Sticking.	Welding arch too short. Current too low.	Increase current values.
Blowing and porosity.	Damp electrodes. Arch too long. Wrong torch polarity.	
Jacks.	Currents too high. Dirty materials.	
The electrode fuses in TIG.	Wrong torch polarity. Type of gas not suitable.	

Maintenance

NOTE

Disconnect the power plug and wait at least 5 minutes before carrying out any maintenance. Maintenance must be carried out more frequently in heavy operating conditions.

Carry out the following operations every three (3) months:

- Replace any illegible labels.
- Clean and tighten the welding terminals.
- Replace damaged gas tubing.
- Repair or replace damaged welding cables.
- Have specialized personnel replace the power cable if damaged.

Carry out the following operations every six (6) months:

- Remove any dust inside the generator using a jet of dry air.
- Carry out this operation more frequently when working in very dusty places.

Handling and transporting the power source

OPERATOR SAFETY: WELDER'S HELMET - GLOWES - SHOES WITH HIGH INSTEPS.
THE WELDING POWER SOURCE DO NOT WEIGHT MORE THAN 25 KG AND CAN BE HANDLED BY THE OPERATOR. READ WELL THE FOLLOWING PRECAUTIONS.
The machine is easy to lift, transport and handle, though the following procedures must always be observed:

- The operations mentioned above can be operated by the handle on the power source.
- Always disconnect the power source and accessories from main supply before lifting or handling operations.
- Do not drag, pull or lift equipment by the cables.

Customer Assistance Policy

The business of The Lincoln Electric Company is manufacturing and selling high quality welding equipment, consumables, and cutting equipment. Our challenge is to meet the needs of our customers and to exceed their expectations. On occasion, purchasers may ask Lincoln Electric for advice or information about their use of our products. We respond to our customers based on the best information in our possession at that time. Lincoln Electric is not in a position to warrant or guarantee such advice, and assumes no liability, with respect to such information or advice. We expressly disclaim any warranty of any kind, including any warranty of fitness for any customer's particular purpose, with respect to such information or advice. As a matter of practical consideration, we also cannot assume any responsibility for updating or correcting any such information or advice once it has been given, nor does the provision of information or advice create, expand or alter any warranty with respect to the sale of our products.
Lincoln Electric is a responsive manufacturer, but the selection and use of specific products sold by Lincoln Electric is solely within the control of, and remains the sole responsibility of the customer. Many variables beyond the control of Lincoln Electric affect the results obtained in applying these types of fabrication methods and service requirements.
Subject to Change – This information is accurate to the best of our knowledge at the time of printing. Please refer to www.lincolnelectric.com for any updated information.

WEEE

07/06

English

Do not dispose of electrical equipment together with normal waste!
In observance of European Directive 2012/19/UE on Waste Electrical and Electronic Equipment (WEEE) and its implementation in accordance with national law, electrical equipment that has reached the end of its life must be collected separately and returned to an environmentally compatible recycling facility. As the owner of the equipment, you should get information on approved collection systems from our local representative.
By applying this European Directive you will protect the environment and human health!

Spare Parts

12/05

Part List reading instructions

- Do not use this part list for a machine if its code number is not listed. Contact the Lincoln Electric Service Department for any code number not listed.
- Use the illustration of assembly page and the table below to determine where the part is located for your particular code machine.
- Use only the parts marked "X" in the column under the heading number called for in the assembly page (# indicate a change in this printing).

First, read the Part List reading instructions above, then refer to the "Spare Part" manual supplied with the machine, that contains a picture-descriptive part number cross-reference.

Authorized Service Shops Location

09/16

- The purchaser must contact a Lincoln Authorized Service Facility (LASF) about any defect claimed under Lincoln's warranty period.
- Contact your local Lincoln Sales Representative for assistance in locating a LASF or go to www.lincolnelectric.com/en-gb/Support/Locator.

Electrical Schematic

Refer to the "Spare Part" manual supplied with the machine

Accessories

Consult the area agents or the dealer.